Bloomgarden, C. 1995. Protecting Endangered Species Under Future Climate Change: From Single-Species Preservation to an Anticipatory Policy Approach. Env. Management. 19;5.

Bjornn, T.C. and D.W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. In: Meehan, W.R., ed. Influences of Forest and Rangeland Management onSalmonid Fishes and Their Habitats. American Fisheries Society Special Publication. 19(4):83-138.

Brazier, J. & G. Brown. 1973. Buffer Strips for Stream Temperature Control. Research Paper 15. Forest Research Laboratory, Oregon State University, Corvallis, OR.

Brinson, M. "Changes in the Functioning of Wetlands Along Environmental Gradients." Wetlands. Special Issue. 13;2. June 1993.

Broderson, J.M. 1973. Sizing Up Buffer Strips to Maintain Water Quality. M.S. Thesis. University of Washington, Seattle, Washington.

Brodie, E., R. Nussbaum, & R. Storm. 1969. An Egg Laying Aggregation of Five Species of Oregon Reptiles. Herpetologica. 25;223-227.

Brosofske, K., et al. 1997. Harvesting Effects on Microclimatic Gradients from Small Streams to Uplands in Western Washington. Ecological Applications. 7(4);1188-1200.

Brown, G.W. and J.T. Krygier. 1970. Effects of Clearcutting on Stream Temperature. Water Resources Conservation. 25:11-13.

Brown, J. & J. Krygiier. 1970. Effects of Clearcutting on Stream Temperatures. Water Resources Research. 6;1133-1139.

Brown, R., ed. 1985. Management of Fish and Wildlife Habitat in the Forests of Oregon and Washington. Handbook # RG-F&WL-192. USDA Forest Service.

Bryant, M. 1984. The Role of Beaver Ponds as Coho Salmon Habitat in Southeast Alaska Streams. Proceedings, Olympic Wild Fish Conference. Port Angeles, WA.

Bull, E., R. Holthausen, & M. Henjum. 1992. "Roost Trees Used by Pileated Woodpeckers in Northeastern Oregon." Journal of Wildlife Management. 56(4):786-793.

Bull, E. & R. Holthausesn. ___. "Population density, Home Range Size, and Habitat Use of Pileated Woodpeckers in Eastern Oregon." Journal of Wildlife Management.

Burman, C. 1998. Oregon Temperature Standard Review. US Environmental Protection Agency, Region 10.

Burroughs, Jr., E.R. and B.R. Thomas. 1977. Declining Root Strength in Douglas-fir after Felling as a Factor in Slope Stability. USDA Forest Service Research Paper INT-190. Ogden, Utah.

Bury, R. & P. Corn. 1988. Douglas Fir Forests in the Oregon and Washington Cascades: Relation of the Herpetofauna to Standa Age and Moisture. in Sarzo, R. K. Severson, & D. Patton, eds. Management of Amphibians, Reptiles, and Small Mammals in North America. Gen Tech Rept RM 166, Rocky Mountain Forest & Range Experiment Station, USDA Forest Service, Fort Collins, CO.

Bury, R. & P. Corn. 1988. "Responses of Aquatic Streamside Amphibians to Timber Harvest: A Review." Contribution No 59. in K. Raedeke, ed., Streamside Management, Riparian Wildlife, and Forestry Interactions. Institute of Forest Resources, University of Washington, Seattle.

Bustard, D. & D. Narver. 1995a. Aspects of the Winter Ecology of Juvenile Coho Salmon and Steelhead Trout. Journal of Fisheries. Resource Board of Canada. 32;667-680.

Bustard, D. & D. Narver. 1995b. Preferences of Juvenile Coho Salmon and Cutthroat Trout Relative to Simulated Alteration of Winter Habitat. Journal of Fisheries. Resource Board of Canada. 32;681-687.

Butts, T. 1992. "Lynx Biology & Management: A Literature Review and Annotated Bibliography." Northern Region, USDA Forest Service, Missoula, MT.

Carey, A. & R. Curtis. 1996. "Conservation of Biodiversity: A Useful Paradigm for Forest Ecosystem Management." Wildlife Society Bulletin. 24(4):610-620.

Carlton, D. 1996. Letter to Bruce Babbitt, et. al., Regarding Current Status of, and Protective Measures Required for, the N. Spotted Owl. Biodiversity Legal Foundation, Boulder, CO.

Defenders of Wildlife. 1998. Oregon's Living Landscape: Strategies and Opportunities to Conserve Biodiversity. Oregon State University Press, Corvallis, OR.

Castelle, A. J., C. Conolly, M. Emers, E.D. Metz, S. Meyer, M. Witter, S. Mauerman, T. Erickson, and S. Cooke. 1992. Wetland Buffers: Use and Effectiveness. Washington State Department of Ecology, Olympia, Washington.

Chen, J. et al. 1995. Growing Season Microclimatic Gradients From Clearcut Edges into Old Growth Douglas Fir Forests. Ecological Applications. 5(1);74-86.

Chen, J.T. 1991. Edge Effects: Microclimatic Pattern and Biological Responses in Old-growth Douglas-fir Forests. Ph.D. Dissertation, University of Washington, Seattle, Washington.

Conner, R. 1988. "Wildlife Populations: Minimally Viable or Ecologically Functional?" Wildlife Society Bulletin. 16:80-84.

Cook, S. Jr. 1960. On the Occurrence and Life History of Contia tenius. Herpetologica. 16;163-173.

Corn, P. & R. Bury. 1989. "Logging in Western Oregon: Responses of Headwater Habitats and Stream Amphibians." Forest Ecology & Management. 29(1-2):39-57.

Darling, N., L. Stonecipher, D. Couch, and J. Thomas. 1982. Buffer Strip Survival Survey. Hoodsport Ranger District, Olympic National Forest, Oregon.

Daubenmire, R. & J. Daubenmire. 1968. Forest Vegetation of Eastern Washington and Northern Idaho. Bulletin #60. Washington Agricultural Experiment Station.

Defenders of Wildlife. 1998. Oregon Biodiversity Project, datasets on CD-ROM. Defenders of Wildlife, Lake Oswego. OR.

Diaz, N., et al. Forest Landscape Analysis & Design: A Process for Developing and Implementing Land Management Objectives. R6ECO TP 04392. USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

Doppelt, B., J. Karr, C. Frissell, & M. Scurlock. 1993. Entering the Watershed: A New Approach to Save America's River Ecosystems. Island Press.

Erman, D.C., J.D. Newbold, and K.B. Roby. 1977. Evaluation of Streamside Bufferstrips for Protecting Aquatic Organisms. California Water Resources Center, University of California, Davis, California. Contribution Number 16.

Fellers, F. 1997. Design of Amphibian Surveys. In Olson, D. W. Leonard, & R. Bury, eds. 1997. Sampling Amphibians in Lenthic Habitats. Northwest Fauna. Society for Northwestern Vertebrate Ecology, Olympia, WA.

Franklin, J. *et al.* 1998. "Alternative Silvicultural Approaches to Timber Harvesting: Variable Retention Systems." in Kohm *et al* (1998)

Franklin, J. & J.A. Fites-Kaufmann. 1996. "Assessment of Late Successional Forests of the Sierra Nevada." Sierra Nevada Ecosystem Project. Final Report to Congress. Vol. II. Center for Water and Wildland Resources, University of California, Davis.

Franklin, J. & R. Forman. 1987. "Creating Landscape Patterns by Forest Cutting: Ecological Consequences and Principles." Landscape Ecology. 1(1):5-18.

Franklin, J. & C. Dyrness. 1973. Vegetation of Washington and Oregon. Rsch Paper PNW-8. Pacific Northwest Forest and Range Research Station, USDA Forest Service, Portland, OR.

Friends of the Wild Swan. June 30, 1998. Letter to Daniel Hall regarding Plum Creek's request to add bull trout to the company's ITP/HCP. Swan Lake, MT.

Friends of the Wild Swan et al. February 27, 1998. Letter to US Fish & Wildlife Service regarding Plum Creek's proposed ITP/HCP for Washington, Idaho, and Montana.

Frissell, C. 1993. A New Strategy for Watershed Restoration and Recovery of Pacific Salmon in the Pacific Northwest. Prepared for the Pacific Rivers Council, Eugene, OR.

Frissell, C., et al. 1993. "An Integrated, Biophysical Strategy for Ecological Restoration of Large Watersheds." Changing Roles in Water Resources Management and Policy. Tech. Pub. TPS-93-2. American Water Resources Assn., Bethesda, MD.

Golde, M. 1999. Summary of Water Quality (Temperature) Standards for Salmonids and Other Aquatic Species. Washington Environmental Council, Seattle, WA.

Groves, C. 1988. "Status and Distribution of the Coeur D'Alene Salamander in Idaho." Unpublished Report. Idaho Dept. of Fish & Game.

Habeck, J. 1988. "Old Growth Forests in the Northern Rocky Mountains." Natural Areas Journal. 8(3).

Hagar, J., W. McComb, & W. Emmingham. 1996. "Bird Communities in Commercially Thinned and Unthinned Douglas Fir Stands of Western Oregon." Wildlife Society Bulletin. 24(2):353-366.

Hansen, A., T. Spies, F. Swanson, et al. 1991. "Conserving Biodiversity in Managed Forests." Bioscience. 41(6):382-392.

Harris, L., C. Maser, & A. McKee. 1982. "Patterns of Old Growth Harvests and Implications for Cascades Wildlife." Transactions North American Wildlife and Natural Resources Conference. 47:374-392.

Hartwell, H., A. Lind, L., L. Ollivier, et al. 1998. Comments on the PalCo HCP/SYP and EIS/EIR With Regard to the Maintenance of Riparian, Aquatic, and Late Seral Ecosystems and Their Associated Amphibian and Reptile Species. Herpetology Research Group, Pacific Southwest Research Station, USDA Forest Service, Arcata, CA.

Hejl, S. 1992. "The Importance of Landscape Patterns to Bird Diversity: A Perspective From the Northern Rocky Mountains." Northwest Environmental Journal. 8(1):119-139.

Herrington, R. 1988. Talus Use by Amphibians and Reptiles in the Pacific Northwest. In Sarzo, R. K. Severson, & D. Patton, eds. Management of Amphibians, Reptiles, and Small Mammals in North America. Gen Tech Rept RM 166, Rocky Mountain Forest & Range Experiment Station, USDA Forest Service, Fort Collins, CO.

Higgins, P. 1998. KRIS Coho. CD ROM database on coho salmon conservation and forest management. Available from the Institute for Fisheries Resources, Eugene, OR.

Holtby, B. ___ Effects of Logging on Stream Temperatures in Carnation Creek, British Columbia, and Associated Impacts on the Coho Salmon. Canadian Journal of Fisheries Aquatic Science. 45;502-516.

Hornocker, M., & H. Hash. 1981. "Ecology of the Wolverine in Northwestern Montana." Canadian Journal of Zoology. 59:1286-1310.

Howell, P. & D. Buchanan, eds., 1992. Proceedings of the Gearhart Mountain Bull Trout Workshop. Oregon Chapter, American Fisheries Society, Corvallis, OR.

Huntington, C. & C. Frissell. 1997. Aquatic Conservation and Salmon Recovery in the North Coast Basin of Oregon: A Crucial Role for the Tillamook and Clatsop State Forests. Prepared for Oregon Trout, Portland, OR.

Johnston, D. & _____. Update to Brown et al (1985). In process.

Jones & Stokes. 1992. Reassembling the Pieces: A Strategy for Maintaining Biological Diversity in California. Prepared under contract for the California Department of Forestry & Fire Protection and the California Department of Fish & Game. Jones & Stokes, Inc., Sacramento.

Jones, L., & M. Raphael. 1990. "Ecology and Management of Marten in Fragmented Habitats of the Pacific Northwest. Progress Report." Forest & Range Experiment Station, USDA Forest Service, Olympia, WA.

Kaminski, T. & H. Hansen. 1984. "Wolves of Central Idaho." Montana Cooperative Wildlife Research Unit, Missoula, MT.

Karr, J. & E. Chu, eds. 1996. Interim Protection for Late Successional Forests, Fisheries, and Watersheds. National Forests East of the Cascade Crest, Oregon and Washington. A Report to the Congress and President of the United States. Eastside Forests Scientific Society.

Kasworm, W. & T. Manley. 1990. "Road and Trail Influences on Grizzly Bears and Black Bears in Northwest Montana." International Conference on Bear Research and Management. 8:79-84.

Katcheson, G. & H. Froelich. 1978. Hydrologic Factors and Environmental Impacts of Mass Soil Movements in the Oregon Coast Range. Water Resources Research Institute. No 14-34-001-7087.

Kauffman, Beschta, et al. 1997. "An Ecological Perspective of Riparian and Stream Restoration in the Western United States." Fisheries. 22:12-24.

Koehler, G. 1990. "Cat Conservation: Lessons from the Lynx." Snow Line. December 18: 7-8.

Koehler, G. 1990. "Population and Habitat Characteristics of Lynx and Snowshoe Hares in North Central Washington." Canadian Journal of Zoology. 568:845-851.

Koehler, G. 1988. "Demographic Characteristics and Habitat Requirements of Lynx in North Central Washington." Final Report. Wildlife Research Institute and Idaho Cooperative Fish & Wildlife Research Unit, University of Idaho, Moscow, ID.

Koehler, G., J. Blakesley, & T. Koehler. 1990. "Marten Use of Successional Forest Stages During Winter in North Central Washington." Northwest Naturalist. 71:1-4.

Koehler, G., W. Moore, & A. Taylor. 1975. "Preserving the Pine Marten: Management Guidelines for Western Forests." Western Wildlands. Summer Issue.

Laufer, J. & P. Jenkins. 1989. "A Preliminary Study of Gray Wolf History and Status in the Region of the Cascade Mountains of Washington State." Final Report to the Washingtonn Department of Wildlife, Olympia, WA.

Lehmkuhl, J., & L. Ruggiero. 1992. "Forest Fragmentation in the Pacific Northwest and its Potential Impacts on Wildlife." in Ruggiero, et al, 1991.

Leidholt, B., D. Hibbs, & W. McComb. 1992. Beaver Dam Locations and Their Effects on Distribution and Abundance of Coho Salmon Fry in Two Coastal Oregon Streams. Northwest Science. 66;218-223.

Lichatowich, J. 1999. Salmon Without Rivers: A History of the Pacific Salmon Crisis. Island Press.

Lynch, J.A, E.S. Corbett, and K. Mussallem. 1985. Best Management Practices for Controlling Nonpoint Source Pollution on Forested Watersheds. Journal of Soil and Water Conservation. 40:164-167.

Marcot, Bruce. 1997. "Biodiversity of Old Forests of the West: A Lesson From Our Elders." in Kohm et al. (1997).

Marshall, D. 1991. "Status of the Black Backed Woodpecker in Oregon and Washington." Portland Audubon Society.

Mattson, D. & R. Knight. 1991. "Implications of Short Rotation (70-120 Year) Timber Management for Yellowstone Grizzly Bears." Interagency Grizzly Bear Study Team Report. USDI National Park Service.

McComb, William *et al.* 1993. "Douglas Fir Forests: Managing for Timber and Mature Forest Habitat." Journal of Forestry. 91;12.

McDade, M.H., F.J. Swanson, W.A. McKee, J.F. Franklin, and J. Van Sickle. 1990. Source Distances For Coarse Woody Debris Entering Small Streams in Western Oregon and Washington. Canadian Journal of Forest Research. 20:326-330.

McDade, M. 1988. The Source Area for Coarse Woody Debris in Small Streams in Western Oregon and Washington. Thesis. Oregon State University.

McLelland, B. & D. Shackleton. 1988. "Grizzly Bears and Resource Extraction Industries: Effects of Roads on Behavior, Habitat Use, and Demography." Journal of Applied Ecology. 25:451-460.

McLelland, B. 1979. "The Pileated Woodpecker in Forests of the Northern Rocky Mountains." in J. Dickson, ed., The Role of Insectivorous Birds in Forest Ecosystems. Academic Press, NY.

Medin, D. & W. Clary. 1991. Small Mammals of a Beaver Pond Ecosystem and Adjacent Riparian Habitat in Idaho. Research Paper INT-445. USDA Forest Service.

Mellen, T., E. Meslow, & R. Mannan. 1992. "Summertime Home Range and Habitat Use of Pileated Woodpeckers in Western Oregon." Journal of Wildlife Management. 56(1):96-103.

Moore, E. 1998. Letter of January 9, 1998, to Rick Applegate, NMFS, Regarding EPA's Assessment and General Comments on NMFS' Draft Proposal to Improve Oregon Forest Practices. US Environmental Protection Agency, Seattle, WA.

Montana Bull Trout Scientific Group (MBTSG). 1998. The relationship between land management activities and habitat requirements of bull trout. Montana Bull Trout Restoration Team, Helena, MT

Montgomery, D. in preparation. Bedrock and alluvial streams. Ongoing research for CMER Committee of the Washington State Timber Fish Wildlife Process.

Moyle, P., et al. 1994. Protection of Aquatic Biodiversity in California: A Five Tiered Approach. Fisheries. 119;2.

Murphy, M. 1995. Forestry Impacts on Freshwater Habitat of Anadromous Salmonids in the Pacific Northwest and Alaska -- Requirements for Protection and Restoration. NOAA Coastal Ocean Program, Decision Analysis Series #7. US Dept. of Commerce, NOAA, Coastal Ocean Office, Silver Springs, MD.

Nelson, C., ed. 1995. Key Elements for Ecological Planning: Management Principles, Recommendations, and Guidelines for Federal Lands East of the Cascade Crest in Oregon and Washington. A Report to the Interior Columbia Basin Ecosystem Management Project. Columbia River Bioregion Campaign, Science Working Group, Walla Walla, WA.

Nelson, S. & T. Hamer. 1995. Nesting Biology and Behavior of the Marbled Murrelet. in Ralph, C., G. Hunt, & M. Raphael, et al, eds. Ecology and Conservation of the Marbled Murrelet. Gen Tech Rept PSW-GTR-152. USDA Forest Service.

Nelson, S. & A. Wilson. 1997. Marbled Murrelet Habitat Characteristics on State Lands in Western Oregon. 1996 Annual Report. Cooperative Wildlife Research Unit, Oregon State University.

NMFS. 1999. Draft Generic Salmonid Conservation Measures for Forestry Activities for a Short Term HCP in California. National Marine Fisheries Service. July 1999.

NMFS. 1998. A Draft Proposal Concerning Oregon Forest Practices. Submitted to the Oregon Board of Forestry Memorandum of Agreement Advisory Committee and the Office of the Governor. National Marine Fisheries Service, Northwest Region, Portland, OR.

NMFS. 1997. Draft Coho Salmon Take Avoidance Guidelines for Forestry Activities in California. June 25, 1997. National Marine Fisheries Service.

NMFS. 1996. Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale. Environmental & Technical Services Div., Habitat Conservation Branch, National Marine Fisheries Service.

NMFS. 1996b. Coastal Salmon Conservation: Working Guidance for Comprehensive Salmon Restoration Initiatives on the Pacific Coast. National Marine Fisheries Service, Portland, OR, and Santa Rosa, CA.

Noss, R. 1990. "Indicators for Monitoring Biodiversity." Conservation Biology. 4(4):355-3645.

Nussbaum, R., E. Brodie, & R. Storm. 1993. Amphibians and Reptiles of the Pacific Northwest. Uiniversity Press, University of Idaho, Moscow, ID.

O'Connell, M. 1988. "Occurrence of the Boreal Owl in Northeastern Washington." Proceedings of a Symposium on the Biology and Conservation of Northern Forest Owls. February, 1987, Winnipeg, Manitoba. Gen. Tech. Rept. RM-142. USDA Forest Service.

Olson, D. 1999. Survey Protocols for Amphibians Under the Survey and Manage Provisions of the Northwest Forest Plan. Gen Tech Rept. Pacific Northwest Research Station, USDA Forest Service.

Olson, D. 1995. Juvenile Salmonid Assemblages in Coastal Oregon Basins: Ecological Interactions and Diversity Patterns. Coastal Oregon Productivity Enhancement Program.

Olson, D. & W. Leonard. 1997. Amphibians Inventory and Monitoring: A Standardized Approach for the Pacific Northwest. In Olson, D., W. Leonard, & R. Bury, eds. 1997. Sampling Amphibians in Lenthic Habitats. Northwest Fauna. Society for Northwestern Vertebrate Ecology, Olympia, WA.

Olson, D., W. Leonard, & R. Bury, eds. 1997. Sampling Amphibians in Lenthic Habitats. Northwest Fauna. Society for Northwestern Vertebrate Ecology, Olympia, WA.

Pacific Seabird Group. 1996. Letter to Mike Spear, US Fish & Wildlife Service.

Peterson, N. 1982a. Immigration of Juvenive Coho Salmon into Riverine Ponds. Canadian Journal of Fisheries Aquatic Science. 39;1308-1310.

Peterson, N. 1982b. Population Characteristics of Juvenive Coho Salmon Overwintering in Riverine Ponds. Canadian Journal of Fisheries Aquatic Science. 39;1303-1307.

Pollock, M. & P. Kennard. 1998. A Low Risk Strategy for Preserving Riparian Buffers Needed to Protect and Restore Salmonid Habitat in Forested Watersheds of Washington State. 1,000 Years Institute, Bainbridge Island, WA.

Pollock, M. & G. Pess. 1998. The Current and Historical Influence of Beaver on Coho Smolt Production in the Stillaguamish River Basin. 10,000 Years Institute, Seattle, WA.

Powell, R. 1982. "The Fisher: Life History, Ecology, & Behavior." University of Minnesota Press, Minneapolis, MN.

PRC. 1996. Healing the Watershed: A Guide to the Restoration of Watersheds and Native Fish in the West. Pacific Rivers Council, Eugene, OR.

Letter - G3

Page 130

Quinn, J. & J. Karr. 1993. "Habitat Fragmentation and Global Change." in P. Kareiva, et al, eds, Biotic Interactions and Global Change. Sinaeur Associates, Sunderland, MD.

Ralph, C., G. Hunt, M. Raphael, & J. Piatt. 1995. Ecology and Conservation of the Marbled Murrelet. Gen Tech Rept PSW-GTR-152. USDA Forest Service.

Recovery plans for Federally-listed species.

Reel, S., L. Schassberger, & W. Ruediger. 1989. "Caring for Our Natural Community: Region 1 Threatened, Endangered, and Sensitive Species Program." Northern Region, USDA Forest Service, Missoula, MT.

Reeves, G., et al. 1995. A Disturbance-Based Ecosystem Approach to Maintaining and Restoring Freshwater Habitats of Evolutionary Significant Units of Anadromous Salmonids in the Pacific Northwest. American Fisheries Society Symposium 17:334-349.

Reid, L. 1999. "Keeley Report." Report to the California Assembly on Watershed Impacts and Restoration.

Reid, L. & R. Ziemer. 1999. Evaluating the Biological Significance of Intermittent Streams. Review Draft. Pacific Southwest Research Station, USDA Forest Service, Arcata, CA.

Reid, Leslie M. 1998. Cumulative watershed effects and watershed analysis. in Naiman, Robert J., and Robert E. Bilby, eds. River Ecology and Management: Lessons from the Pacific Coastal Ecoregion. Springer-Verlag, N.Y.

Reid, L. M. 1998. Forest roads, chronic turbidity, and salmon. EOS, Transactions, American Geophysical Union 79(45): F285.

Reid, L. M. (ed.). In review. Issues in watershed analysis. PSW General Technical Report. 1998.(ms)

Reid, L. M., T. Dunne, and J. Lewis. In review. Calculating average landslide frequency: a simplified method. Earth Surface Processes and Landforms. (submitted 6/28/98)

Reid, Leslie M., and Fredrick J. Swanson. In review. Sediment budgeting strategies for land management applications. Physical Geography. (submitted 9/29/98)

Reid, L. M., and R. R. Ziemer. In review. 2. Evaluating the biological significance of intermittent streams. In: L. M. Reid (ed.). Issues in watershed analysis. PSW General Technical Report. 1998. 12 p. (ms)

Reid, L. M., R. R. Ziemer, M. E. Smith, and C. Close. In review. 3. Evaluation of unstable lands for interagency watershed analysis. In: L. M. Reid (ed.). Issues in watershed analysis. PSW General Technical Report. 1998. 15 p. (ms)

Reid, L. M., R. R. Ziemer, and M. J. Furniss. In review. 4. What do we need to know about roads? In: L. M. Reid (ed.). Issues in watershed analysis. PSW General Technical Report. 1998. 17 p. (ms)

Reid, L. M., and R. R. Ziemer. In review. 5. Basin assessment and watershed analysis. In: L. M. Reid (ed.). Issues in watershed analysis. PSW General Technical Report. 1998. 16 p. (ms)

Reid, L. M. 1991. Research and cumulative watershed effects. Final Report to the California Department of Forestry and Fire Protection. 221 p.

Reid, Leslie M. 1998. Cumulative watershed effects: Caspar Creek and beyond. In: Ziemer, Robert R., technical coordinator. Proceedings of the conference on coastal watersheds: the Caspar Creek story, 1998 May 6; Ukiah, CA. General Tech. Rep. PSW GTR-168. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 117-127.

Reid, Leslie M., and Sue Hilton. 1998. Buffering the buffer. In: Ziemer, Robert R., technical coordinator. Proceedings of the conference on coastal watersheds: the Caspar Creek story, 1998 May 6; Ukiah, CA. General Tech. Rep. PSW GTR-168. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 71-80.

Reifsnyder, W.E. and H.W. Lull. 1965. Radiation Energy in Relation to Forest Science. Washington D.C. USDA-FS Technical Bulletin 1344.

Reynolds, R. & B. Linkhart. 1992. "Flammulated Owls in Ponderosa Pine: Evidence for Preference of Old Growth." Proceedings of a Workshop on Old Growth Forests in the Southwest and Rocky Mountain Region. Gen Tech Rept RM-213. USDA Forest Service, Portal, AZ.

Rodrick, E. and R. Milner. 1991. Management Recommendations for Washington's Habitats and Species. Washington Department of Wildlife, Seattle, Washington.

Rudolph, D.C., and J.G. Dickson. 1990. Streamside Zone Width and Amphibian and Reptile Abundance. The Southwest Journal. 35(4):472-476

Ruggerio, L., K. Aubrey, A. Carey, et al, eds. 1991. Wildlife and Vegetation of Unmanaged Douglas Fir Forests. Gen. Tech. Rept. PNW-GTR-285. Pacific Northwest Range and Forest Experiment Station, USDA Forest Service, Portland, OR.

Salwasser, H. & F. Samson. 1985. "Cumulative Effects Analysis: An Advance in Forest Planning and Wildlife Management." Transactions North American Wildlife and Natural Resources Conference. 50:313-321.

Schillinger, Randy, et al. 1998. Impact on Industrial Timberlands Value of "No Touch" Buffer Zones Along Waterways in Western Washington. prepared for Washington Environmental Council. Eugene, OR.

Schowalter, Timothy et al. 1997. "Integrating the Ecological Roles of Phytophagous Insects, Plant Pathogens, and Mycorrhizae in Managed Forests." in Kohm et al. (1997).

Shaffer, M. 1992. "Keeping the Grizzly Bear in the American West: A Strategy for Real Recovery." The Wilderness Society, Washington, DC.

Shaffer, M. 1992. "Population Viability Analysis." in D. Decker et al, eds, Challenges in the Conservation of Biological Resources, A Practioner's Guide. Westview Press.

Sharp, B. 1992. "Neotropical Migrants on National Forests in the Pacific Northwest: A Compilation of Existing Information." Portland, OR.

Sidle, R.C., A.J. Pearce, and C.L. O'Laughlin. 1985. Hillslope Stability and Land Use. Water Resources Monograph Series II.

Spackman, S.C. and J.W. Hughes. 1994. Assessment of Minimum Stream Corridor Width for Biological Conservation: Species Richness and Distribution along Mid-Order Streams in Vermont, USA. Biological Conservation. 71(3):325-332.

Spence, B., et al. An Ecosystem Approach to Salmonid Conservation. ManTech Environmental Research Service, Corvallis, OR. TR-4501-96-6057. Prepared for the National Marine Fisheries Service, Portland, OR.

Spies, T. ___. "Plant Species Diversity and Occurrence in Young, Mature, and Old Growth Douglas Fir Forests in Western Oregon and Washington."

Spies, T. & J. Franklin. ____. "The Structure of Natural Young, Mature, and Old Growth Douglas Fir Forests in Oregon and Washington."

Spies, T. & J. Franklin. 1988. "Old Growth and Forest Dynamics in the Douglas Fir Region of Western Oregon and Washington." Natural Areas Journal. 8;3.

Stebbins, R. 1954a. Amphibians of Western North America. McGraw Hill Books, New York, NY.

Stebbins, R. 1954b. Natural History of the Salmanders of the Plethodontid Genus Ensatina. Zoology Publications. University of California. 54;47-123.

Steinblums, I.J. 1977. Streamside Buffer Strips: Survival, Effectiveness, and Design. M.S. Thesis. Oregon State University, Corvallis, OR. 181 pp.

Swanson, F. et al. 1976. History, Physical Effects, and Management Implications of Large Organic Debris in Western Oregon Streams. PNW-56. Pacific Northwest Forest & Range Research Station, USDA Forest Service.

Takentat, A. 1988. An Analysis of Solar Beam Penetration Through Circular Gaps in Canopies of Uniform Thickness. Agricultural and Forest Meteorology. 42:307-320.

Thomas et al. 1993. Forest Ecosystem Management: An Ecological, Economic, and Social Assessment. Report of the Forest Ecosystem Management Assessment Team.

Thomas, C. 1990. "What Do Real Population Dynamics Tell Us About Minimum Viable Population Sizes?" Conservation Biology. 4(3):324-325.

Thompson, G. 1991. Determining Minimum Viable Populations Under the Endangered Species Act. NOAA Technical Memorandum NMFS/F/NWC-198. National Marine Fisheries Service, Seattle, WA.

Tilt, W., R. Norris, & A. Eno. 1987. "Wolf Recovery in the Northern Rocky Mountains." National Audubon Society and National Wildlife Federation, Washington, DC.

Trotter, P. 1995. Occurrence and Habitat Requirements of Headwater Resident Trout in Washington Streams. Report to Washington Trout. Duvall, WA.

USDA FS. Guidelines for Habitat Conservation Assessments. USDA Forest Svc., Washington, DC.

USDA FS *et al.* 1993. Forest Ecosystem Management: an Ecological, Economic, and Social assessment. Report of the Forest Ecosystem Management Assessment Team. USDA Forest Service, USDOI FWS, USDOI BLM, US EPA, USDOI NPS, and USDOC NMFS. (1993).

USFWS. 1998. Letter of February 16, 1998, to Wille Stelle, Jr., Regional Administrator, NMFS, Conveying Comments on the NMFS "Draft Proposal to Improve Oregon Forest Practices." US Fish & Wildlife Service, Portland, OR.

USFWS. 1998b. Bull Trout Interim Conservation Guidance. US Fish & Wildlife Service, Lacey, WA.

Van Sickle, J. and S.V. Gregory. 1990. Modeling Inputs of Large Woody Debris to Streams from Falling Trees. Canadian Journal of Forest Research. 20:1593-1601.

Vogel, W. 1998. Letter to John Engbring, USFWS, Lacey Washington, regarding "Addition of the Columbia River...Bull Trout to Incidental Take Permit...for Plum Creek Timber Company and Anticipated Take Levels..." Western Washington Office, US Fish & Wildlife Service, Lacey, WA.

WA DFW. 1997a. Management Recommendations for Washington's Priority Habitats -- Amphibians and Reptiles. Washington State Dept. Fish & Wildlife, Olympia, WA.

WA DFW. 1997b. Management Recommendations for Washington's Priority Habitats -- Riparian. Washington State Dept. Fish & Wildlife, Olympia, WA.

WA DFW. 1995. Management Recommendations for Washington's Priority Habitats -- Invertebrates. Washington State Dept. Fish & Wildlife, Olympia, WA.

WA DNR TFW. 1997. Draft species lists developed by the Landscape & Wildlife Advisory Group, Timber Fish & Wildlife Program, Washington Department of Natural Resources, Olympia, WA.

WAFC. 1997b. Summary of Information on Late Successional Species From the FEMAT Report. Western Ancient Forest Campaign, Portland, OR.

Walker, Brian et al. 1999. "The Terrestrial Biosphere and Global Change: Implications for Natural and Managed Ecosystems." Cambridge Univ. Press.

Walls, S., A. Blaustein, & J. Beatty. 1992. "Amphibian Biodiversity of the Pacific Northwest with Special Reference to Old Growth Stands." Northwest Environment Journal. 8(1):53-69.

Warren, N. ed., 1990. Old Growth Habitats and Associated Wildlife in the Northern Rocky Mountains. Forest Service Report R1-90-42. Northern Region Wildlife Habitat Relationships Program, USDA Forest Service, Missoula, MT.

Weaver, W., & D. Hagans. 1994. Handbook for Forest and Ranch Roads: A Guide for Planning, Designing, Constructing, Reconstructing, and Closing Wildland Roads. Prepared by Pacific Watershed Associates for Mendocino County Resource Conservation District, Ukiah, CA.

Welsh, H. 1990. "Relictual Amphibians and Old Growth Forests." Conservation Biology. 4(3):309-319.

Wemple, B., J. Jones, & G. Grant. 1996. Channel Network Extension by Logging Roads in Two Basins in Western Cascades, Oregon. Water Resources Bulletin. 32(6);11185.

Wilcove, D., C. McLellan, & A. Dobson. 1986. "Habitat Fragmentation in the Temperate Zone." in M. Soule, ed., Conservation Biology: The Science of Scarcity and Diversity. Sinauer Associates.

Willson, M. S. Gende, & B. Marston. 1998. "Fishes and the Forest: Expanding Perspectives on Fish-Wildlife Interactions." BioScience. 48;6. June, 1998.

Willson, M. & K. Halupka. 1995. "Andadromous Fish as Keystone Species in Vertebrate Communities." Conservation Biology. 9;3. June, 1995.

Wu, T.H. 1986. Root Geometry Model and Simulation. Unpublished Final Report. National Science Foundation Grant DEE-811253. USDA Forest Service Grant PNW-83-317. Department of Civil Engineering, Ohio State University, Ohio.

Also, see Mayer et al. (1988) above under Species Lists, and Applegarth et al (1997), Benda et al. (1998), (Bingham) et al (1997), Erman, Erman, & Schilling (1999), Frissell (1998), Heiken et al (1997),

Huntington (1998), Karr (1991), King (1989), Lichatowich et al (1997), Meehan et al (1991), Moyle et al (1999), Nelson et al (1999), PAS (1997), Pollock et al (1999), PRC (1997), Reid (1998), Reid (1999), Soule et al (1987), and Welsh et al (1998) below under Assessments. Benda et al. (1998) also lists additional resources for terrestrial species (be sure to get the full report).

***Additional Research Indicating That Logging and Associated Road Building Can Impact Fluvial Peak Flows and In-Stream Habitat Conditions:***

Chamberlin, T.W., Harr, R.D. and F.H. Everest. 1991. Timber harvesting, silviculture, and watershed processes. American Fisheries Society Special Publication 19:181-205.

Chamberlin, T.W. 1982. Influence of forest and rangeland management on anadromous fish habitat in western North America: timber harvest. USDA Forest Service, Pacific Northwest Forest and Range Experimentation Station. GTR-136.

Cheng, J.D., Black, T.A., de Vries, J., Willington, R.P. and B.C. Goodell. 1975. The evaluation of initial changes in peak streamflow following logging of a watershed on the west coast of Canada. International Association of Hydrological Sciences Publication 117:1-21.

Espinosa, Jr., F.A, Rhodes, J.J. and D.A. McCullough. 1997. The failure of existing plans to protect salmon habitat in the Clearwater National Forest in Idaho. Journal of Environmental Management 49:205-230.

Grant, G. 1994. Peak Flow Responses to Clearcutting and Roads. Invited Presentation to the Timber/Fish/Wildlife Low Elevation Hydrology Workshop. March 11, 1994. Olympia, WA.

Grant, G and J. Jones. 1996. Peak Flow Responses to Clearcutting and Roads, Western Cascades, Oregon. Water Resources Research. April, 1996.

Harr, R.D. 1986. Effects of clearcutting on rain-on-snow runoff in western Oregon: a new look at old-studies. Water Resources Research 22(7):1095-1100.

Harr, R.D. 1979. Effects of timber harvest on streamflow in the rain-dominated portion of the Pacific Northwest. In: Proceedings of the workshop on scheduling timber harvest for hydrologic concerns. Pacific Northwest Region, USDA Forest Service. Portland, OR.

Hart, G. E., Jr. 1966. Forest cutting to increase streamflow in the White Mountains. New Hampshire Forest Notes No. 89, pp. 6-9.

Hornbeck, J. W. 1973. Storm flow from hardwood-forested and cleared watersheds in New Hampshire. Water Resour. Res. 9(2):346-354.

Hornbeck, J. W., R. S. Pierce and C. A. Federer. 1970. Streamflow changes after forest clearing in New England. Water Resour. Res. 6(4):1124-1132.

Hornbeck, J. W. and R. S. Pierce. 1970. Storm hydrograph changes following forest clearing in New England. Proc. 15th IUFRO Congress, Gainesville, Florida. p. 230.

Hornbeck, J. W. 1975. Streamflow response to forest cutting and revegetation. Water Resour. Bull. 11(6):1257-1260.

Hornbeck, J. W., G. E. Likens, R. S. Pierce and F. H. Bormann. 1975. Strip cutting as a means of protecting site and streamflow quality when clearcutting northern hardwoods. pp. 208-229. In: B. Bernier and C. H. Winget (eds.). Proc. 4th North American Forest Soils Conference on Forest Soils and Forest Land Management. August 1973. Quebec, Canada.

Hornbeck, J. W., R. S. Pierce, G. E. Likens and C. W. Martin. 1975. Moderating the impact of contemporary forest cutting on hydrologic and nutrient cycles. pp. 423- 433. In: Proc. of Internat. Symp. on Hydrologic Sciences. Publ. 117. Tokyo, Japan.

Hornbeck, J. W. and G. Stuart. 1976. When ski trails are cut through forest land, what happens to stream flow? Ski Area Management 15(4):34-36, 47.

Hornbeck, J. W. and S. J. Ursic. 1979. Intensive harvest and forest streams: are they compatible? pp. 249-262. In: Proc. Impact of Intensive Harvesting on Forest Nutrient Cycling. SUNY, College of Environmental Science and Forestry, Syracuse.

King, J. 1989. Streamflow responses to roadbuilding and harvesting: a comparison with the equivalent clearcut area procedure. Intermountain Research Station, USDA Forest Service. Research Paper INT-401. Ogden, UT.

Lavigne, R. W. 1960. A time-corrector device for adjusting streamflow records. U.S. Forest Service, Northeastern Forest Experiment Station, Forest Research Note 98. 4 pp.

Lawrence, G. B. and C. T. Driscoll. 1989. Spatial patterns of concentration-discharge relationships in stream water draining the Hubbard Brook Experimental Forest, New Hampshire. Abstract for Chapman Conference on Hydrogeochemical Responses of Forested Catchments, American Geophysical Union, Bar Harbor, Maine.

Leaf, C.F. 1975. Watershed management in the central and southern Rocky Mountains: a summary of the status of our knowledge by vegetation types. Research Paper RM-142. Rocky Mountain Forest and Range Experiment Station, USDA Forest Service. Fort Collins, CO. 28 pp.

Leaf, C.F. 1975. Watershed management in the subalpine zone: the status of our knowledge. Research Paper RM-137. Rocky Mountain Forest and Range Experiment Station, USDA Forest Service. Fort Collins, CO. 31 pp.

Likens, G. E. 1989. Linkages between hydrology and biogeochemistry in forested catchments. Abstract for Chapman Conference on Hydrogeochemical Responses of Forested Catchments, American Geophysical Union, Bar Harbor, Maine.

Likens, G. E. 1972. Effects of deforestation on water quality. pp. 133-140. In: Proc. Amer. Soc. Civil Engineers Symp. on Interdisciplinary Aspects of Watershed Management. August 1970. Bozeman, Montana.

Lull, H. W. and R. S. Pierce. 1960. Prospects in the Northeast for affecting the quantity and timing of water yield through snowpack management. West. Snow Conf. Proc., pp. 54-62.

Lull, H. W. and R. S. Pierce. 1960. Prospects in the Northeast for affecting the quantity and timing of water yield through snowpack management. West. Snow Conf. Proc., pp. 54-62.

Martin, C. W. and J. W. Hornbeck. 1972. Lysimeter snowmelt and streamflow on forested and cleared sites. pp. 111-118. In: Eastern Snow Conference Proceedings.

Montana Bull Trout Scientific Group (MBTSG). 1998. The relationship between land management activities and habitat requirements of bull trout. Montana Bull Trout Restoration Team, Helena, MT

Mosko, T.L., Jeffers, B.L., King, J.G., and W.F. Megahan. 1990. Streamflow data for undisturbed, forested watersheds in central Idaho. USDA Forest Service, Intermountain Forest and Range Experiment Station. GTR INT-272.

Pierce, R. S. 1973. Forest management – its impact on the hydrology and ecosystems. Bull. Ecol. Soc. Amer. 54(1):15.

Pierce, R. S. 1971. Clear cutting and stream water. New Hampshire Forest Notes. [spring]

Pierce, R. S. 1969. Forest transpiration reduction by clearcutting and chemical treatment. Northeastern Weed Control Conference 23:344-349.

Reiners, W. A. 1991. Twenty years of ecosystem development on a clear-cut watershed at Hubbard Brook Experimental Forest. Bull. Ecol. Soc. Amer. 72(2):228.

Reiners, W. A. and T. L. Gates. 1993. Spatial patterning of ecosystem recovery on a deforested watershed, Hubbard Brook, New Hampshire. Bull. Ecol. Soc. Amer. 74(2):406.

Sidle, R. C. and J. W. Hornbeck. 1991. Cumulative effects: a broader approach to water quality research. J. Soil and Water Conserva. 46:268-271.

Smith, D. K. 1982. The knowledge flows from Hubbard Brook. An advanced ecosystem study. Yale Alumni Magazine and Journal XLV(6):17-20.

Sullivan, K., Lisle, T.E., Dolloff, C.A., Grant, G.E., and L.M. Reid. 1987. Stream channels: the link between forests and fishes. In: Streamside management: forestry and fishery interations. E.O. Salo and T.W. Cundy, eds. University of Washington, Institute of Forest Resources Contribution 57. Seattle, WA.

Troendel, C.A. 1980. Watershed management in the Rocky Mountains. In: Proceedings from the Rocky Mountain Forest Industries Conference. May 7-8, 1980. Jackson, WY.

Troendel, C.A. and R.M. King. 1987. The effect of partial and clearcutting on streamflow at Deadhorse Creek, Colorado. Journal of Hydrology 90:145-157.

Troendel, C.A. and R.M. King. 1985. The effect of timber harvest on the Fool Creek watershed, 30 years later. Water Resources Research 21(12):1915-1922.

U.S. Department of Agriculture, Forest Service (USFS). 1981. Guide for predicting sediment yields from forested watersheds. US Forest Service Northern Region, Intermountain Region, and Intermountain Forest and Range Experiment Station.

U.S. Department of Agriculture, Forest Service (USFS). 1974. Forest Hydrology part II – Hydrologic effects of vegetation manipulation. Missoula, MT: U.S. Department of Agriculture, Forest Service. 229 pp.

USDA Forest Service (USFS). [year?] WATSED: water and sediment yields. Range, Air, Watershed, and Ecology Staff Unit, USDA Forest Service, Region 1 and Montana Cumulative Watershed Effects Cooperative.

Weaver, T.M. and J.J. Fraley. 1991. Fisheries habitat and fish populations. Flathead basin forest practices, water quality and fisheries cooperative program. Flathead Basin Commission, Kalispell, MT.

Zuuring, H.R. and D.F. Potts. WATSIM: a user's guide. Montana Forest and Conservation Experiment Station. School of Forestry, University of Montana, Missoula.

***Additional References and Resources Regarding Livestock Grazing:***

Armour, C. L., D. A. Duff, W. Elmore. 1991. The effects of livestock grazing on riparian and stream ecosystems. Fisheries 16(1): 7-11.

Armour, C., D. Duff, W. Elmore. 1994. The effects of livestock grazing on western riparian and stream ecosystem. Fisheries 19(9): 9-12.

Belsky, A. J. 1986. Does herbivory benefit plants? A review of the evidence. Amer. Natur. 127: 870-892.

Belsky, A. J. 1987. The effects of grazing: confounding ecosystem, community, and organism scales. Amer. Natur. 127: 870-892.

Belsky, A. J. and D. M. Blumenthal. 1997. Effects of livestock grazing on stand dynamics and soils in upland forests of the interior West. Conserv. Biol. 11: 315-327.

Belsky, A. J., A. Matzke, S. Uselman. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. J. Soil and Water Conserv. 54(1): 419-431.

Beschta, R. L. 1991. Stream habitat management for fish in the northwestern United States: the role of riparian vegetation. Amer. Fisheries Soc'y Symp. 10: 53-58.

Beschta, R. L., W. L. Platts, J. B. Kauffman, M. T. Hill. 1994. Artificial stream restoration—money well spent or an expensive failure? *IN* Environmental Restoration: Proc. Universities Council on Water Resources, 1994.

Chaney, E., W. Elmore, W. S. Platts. 1990. Livestock grazing on western riparian areas. Northwest Resource Information Center. Eagle, ID. 45 pages.

Chaney, E., W. Elmore, W. S. Platts. 1993. Managing change: livestock grazing on western riparian areas. Northwest Resource Information Center. Eagle, ID. 31 pages.

Elmore, W. 1992. Riparian responses to grazing practices. Pages 442-457 *IN* R. J. Naiman (ed.). WATERSHED MANAGEMENT: BALANCING SUSTAINABILITY AND ENVIRONMENTAL CHANGE. Springer Verlag. New York, NY.

Elmore, W. 1996. Riparian areas: perceptions in management. USDA – Forest Service, Pacific Northwest Res. Stn. Natural Resource News 6(3): 9.

Elmore, W. and B. Kauffman. 1994. Riparian and watershed systems: degradation and restoration. Pages 212-231 *IN* M. Vavra, W. A. Laycock, R. D. Pieper (eds.). ECOLOGICAL IMPLICATIONS OF LIVESTOCK HERBIVORY IN THE WEST. Soc. Range Manage. Denver, CO.

Elmore, W. and R. L. Beschta. 1987. Riparian areas: perceptions in management. Rangelands 9: 260-265.

Fleischner, T. L. 1994. Ecological costs of livestock grazing in western North America. Conserv. Biol. 8: 629-644.

Kauffman, J. B. and W. C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications: a review. J. Range Manage. 37: 430-437.

Kauffman, J. B., W. C. Krueger, M. Vavra. 1983a. Impacts of cattle on streambanks in northeastern Oregon. J. Range Manage. 36: 683-685.

Kauffman, J. B., W. C. Krueger, M. Vavra. 1983b. Effects of late season cattle grazing on riparian plant communities. J. Range Manage. 36: 685-691.

Kauffman, J. B., W. C. Krueger, M. Vavra. 1983c. Effects of late season cattle grazing on riparian ecosystems and streamside management implications: a review. J. Range Manage. 37(5): 430-438.

Ohmart, R. D. 1996. Historical and present impacts of livestock grazing on fish and wildlife resources in western riparian habitats. Pages 245-279 *IN* P. R. Krausman (ed.). RANGELAND WILDLIFE. Soc. Range Manage. Denver, CO.

Todd, M. and W. Elmore. 1997. Historical changes in western riparian ecosystems. Trans. North Amer. Wildl. and Nat. Res. Conf. 62: 454-468.

Wilcove, D. 1998. Quanitifying Threats to Imperiled Species in the United States. BioScience: 48(8): 610--.

***Forest Management Considerations and Alternatives:***

American Lands. 1999. Improving Forest HCPs by Recognizing the Practicability of Alternative Forest Management Regimes. American Lands Alliance, Portland, OR.

Franklin, J. *et al.* 1998. ""Alternative Silvicultural Approaches to Timber Harvesting: Variable Retention Systems." in Kohm *et al* (1998)

Franklin, J. 1989. "Importance of Ecological Diversity in Maintaining Long Term Site Productivity." in D. Perry, ed., Maintaining the Long Term Productivity of Pacific Northwest Coniferous Forests, Oregon State University Press, Corvallis, OR.

Kohm, K., et al. 1997. Creating a Forestry for the 21st Century: The Science of Ecosystem Management. Kathryn Kohm & Jerry Franklin, eds. Island Press, Covelo, CA.

McComb, William *et al.* 1993. "Douglas Fir Forests: Managing for Timber and Mature Forest Habitat." Journal of Forestry. 91;12.

Perry, D. 1994. Forest Ecosystems. Department of Forest Science & Cascade Center for Ecosystem Management, Oregon State University, Corvallis, OR. Johns Hopkins University Press.

***Assessments, Guidebooks, and Recommended Standards for Mitigation, Adaptive Management, Etc.:***

Ackerman, S. 1997. Conservation Principles for Western Oregon State Forest Habitat Conservation Plan. National Wildlife Federation, Portland, OR.

Aengst, P., et. al. 1998. Balancing Public Trust and Private Interest: An Investigation of Public Participation in Habitat Conservation Planning. Masters Thesis. School of Natural Resources, University of Michigan, Ann Arbor, MI.

American Lands. 1999. Summary of Westside Forest Management Standards for Aquatic/Riparian Resources. Forest Biodiversity Program, American Lands, Portland, OR.

American Lands. 1998b. Inventory of Pending and Approved Forest HCPs in Western States. American Lands Alliance, Forest Biodiversity Program, Portland, OR.

American Lands. 1998. Examples of Fish and Wildlife Conservation Needs on Non-Federal Forestlands and Species Harmed by HCPs. Forest Biodiversity Program, American Lands, Portland, OR. Available at <www.americanlands.org>

Applegarth, John, et. al. 1997. A Peer Review of the Weyerhaeuser Willamette Habitat Conservation Plan and Environmental Analysis. Chris Beckwith, ed. Commissioned by Portland Audubon Society, Portland, OR. Available from PAS at 503-292-6855.

Letter - G3

Page 137

Bean, M. 1998. "Four Sure Ways to Undermine a Good Idea...And Hurt Endangered Species." Endangered Species UPDATE. 15(6).

Bean, M., et al. 1991. Reconciling Conflicts Under the Endangered Species Act: The Habitat Conservation Planning Experience. World Wildlife Fund. Washington, DC.

Benda, L., et al. 1998. Independent Scientific Review of Oregon Dept. of Forestry's Proposed W. Oregon State Forests HCP. John Hayes, ed. College of Forestry, Oregon State Univ. Corvallis, OR.

Bingham, Bruce, et. al. 1997. "Mitigation of Habitat "Take:" Application to Habitat Conservation Planning." Conservation Biology. 11;1.

Cheever, Frederico, et al. 1998. Summary of Key Findings and Recommendations from the Workshop on Optimizing Habitat Conservation Planning. Natural Heritage Institute, San Francisco, CA.

Clark, T., et al. 1994. Endangered Species Recovery: Finding the Lessons, Improving the Process. Island Press, Covelo, CA.

EPIC & Sierra Club. 1998. Synopsis of Biological Opinions Issued by USFWS, Region 1. Environmental Protection Information Center, Redway, CA, & Sierra Club, San Francisco, CA. Available through American Lands' Forest Biodiversity Program, Portland, OR.

Erman, Nancy, L. Reid, D. Erman, H. Welsh, & F. Schilling. 1999. Comments on Pacific Lumber's Headwaters HCP. Independent analyses of the Headwaters HCP. Available at <www.igc.org/epic/pages/hcp_review.html>

Frissell, C. 1998. Comments on the Sustained Yield Plan/Habitat Conservation Plan for the Pacific Lumber Company.

GAO. 1994. Endangered Species Act: Information on Species Protection on NonFederal Lands. Report to Congressional Requestors. US General Accounting Office, Washington, DC.

Hall, D. 1997. "Using Habitat Conservation Plans to Implement the Endangered Species Act in Pacific Coast Forests: Common Problems and Promising Precedents." Environmental Law. 27;3.

Hood, L. et al. 1998. Frayed Safety Nets: Conservation Planning Under the Endangered Species Act. Defenders of Wildlife, Washington DC.

Hrubes, Robert, et. al. 1999. Comments of the Silviculture Review Team Members on Pacific Lumber's Headwaters HCP. Commissioned by EPIC, Redway, CA, and Sierra Club - California. Available at <www.igc.org/epic/pages/hcp_review.html>

Huntington, C. 1998. Comments on April '98 Draft W. Oregon State Forests HCP as a Mechanism for Restoring Aquatic Habitats and At-Risk Salmon. Clearwater BioStudies, Canby, OR.

Jackson, Jerome. 1997. "Niche Concepts and Habitat Conservation Planning." Endangered Species Update. 14;7&8. School of Natural Resources & Environment, University of Michigan, Ann Arbor.

Kaiser, J. 1997. "When Habitat is Not a Home." Science. 276;1636.

Kareiva, Peter, et al. 1999. Using Science in Habitat Conservation Plans. National Center for Ecological Analysis & Synthesis, Santa Barbara, CA, and the American Institute of Biological Sciences, Washington, DC.

Karr, J. and E. W. Chu. 1999. Restoring Life in Running Waters: Better Biological Monitoring. Island Press, Washington, DC.

Karr, J. 1998. "Rivers as Sentinels: Using the Biology of Rivers to Guide Landscape Management." River Ecology and Management: Lessons from the Pacific Coastal Region. R. Naiman and R. Bilby, eds. Springer, NY.

Karr, J. 1991. "Biological Integrity: A Long Neglected Aspect of Water Resource Management." Ecological Applications. 1:66-84. (proposes water quality and aquatic ecosystem monitoring indicators)

King, J. 1989. Streamflow Responses to Road Building and Harvesting: A Comparison With the Equivalent Clearcut Procedure. Rsch Paper INT-401. USDA Forest Service, Intermountain Forest & Range Experiment Station, Ogden, UT.

Kostyack, John. 1998. "Surprise!" The Environmental Forum. 15;2. Environmental Law Institute.

Lichatowich, Jim, et. al. 1997. Scientific Panel Comments on the Multi-Species Conservation Plan for the Weyerhaeuser Willamette Timberlands. Commissioned by the Pacific Rivers Council, Eugene, OR. Available from the PRC at 541-345-0119.

McCammon, B. 1993. Determining the Risk of Cumulative Watershed Effects Resulting From Multiple Activities Under Section 7 of the ESA. USDA Forest Service.

Meehan, et al. 1991. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. Special Pub. 19. American Fisheries Society, Bethesda, MD.

Minnette, M., et al. 1997. A Citizen's Guide to Habitat Conservation Plans. National Audubon Society. Washington, DC.

Moyle, Peter, et. al. 1999. Comments of Aquatics Review Team Members on the Pacific Lumber's Headwaters HCP. Commissioned by EPIC, Redway, CA, and Sierra Club - California. Available at <www.igc.org/epic/pages/hcp_review.html>

Murphy, D., et al. 1996. A Statement On Proposed Private Lands Initiatives and Reauthorization of the Endangered Species Act from the Meeting of Scientists at Stanford University. In Noss *et al.* (1997).

National Audubon Society. 1997. Report of the National Audubon Society Task Force on Habitat Conservation Plans. National Audubon Society, Washington, DC.

Nelson, Kim, et. al. 1999. Comments of the Marbled Murrelet, Northern Spotted Owl, and Unlisted Species Review Teams Members on the Headwaters HCP. Commissioned by EPIC, Redway, CA, and Sierra Club - California. Available at <www.igc.org/epic/pages/hcp_review.html>

NHI. 1998. Compendium of Empirical Reviews and Scholarly Analysis of the Experience with Habitat Conservation Planning Under Section 10 of the Endangered Species Act. Natural Heritage Institute, San Francisco, CA.

Nielsen, J. 1998. "Electrofishing California's Endangered Fish Populations." National Marine Fisheries Service (?).

Noss, R., et al. 1997. The Science of Conservation Planning: Habitat Conservation Under the Endangered Species Act. World Wildlife Fund, Washington, DC. Island Press, Covelo, CA.

Noss, R., et al. 1994. Saving Nature's Legacy. Island Press.

PAS. 1997. A Peer Review of the Weyerhaeuser Willamette Habitat Conservation Plan and Environmental Analysis. Chris Beckwith, et al, eds. Portland Audubon Society, Portland, OR.

Pollock, M., D. Montgomery, J. Karr, et al. 1999. Letter to Washington Governor Gary Locke, Commenting on the "Forests & Fish Report."

PRC. 1997. Scientific Panel Comments on the Multi-Species Conservation Plan for the Weyerhaeuser Willamette Timberlands. Pacific Rivers Council, Eugene, OR.

PRC. 1996. Healing the Watershed: A Guide to the Restoration of Watersheds and Native Fish in the West. Pacific Rivers Council, Eugene, OR.

Raines, C., et. al. 1997. HCP Guidance for Sierra Club. Unpublished. Seattle, WA.

Reid, Leslie M. 1998. Review of the Sustained Yield Plan / Habitat Conservation Plan for the properties of The Pacific Lumber Company. Unpublished report prepared at the request of Congressman George Miller and EPA.

Reid, Leslie M. 1999. Review of the Final EIS/EIR and HCP/SYP for the Headwaters Forest. Unpublished report prepared at the request of Congressman George Miller.

Roper, R., et al. 1997. Stream Restoration: Is Fisheries Biology Enough? Fisheries. 22;5.

Ruhl, J. 1995. Regional Habitat Conservation Planning Under the Endangered Species Act: Pushing the Legal and Practical Limits of Species Protection. SW.L.J. 44;1393.

Schilling, Fraser. 1997. "Do Habitat Conservation Plans Protect Endangered Species?" Science. 276;1662.

Smallwood, K, et al. (submitted for publication) Using the Best Scientific Data for Endangered Species Conservation.

Soule, M., et al. 1987. Viable Populations for Conservation. Michael Soule, ed. Cambridge Press.

Taylor, Melinda. 1994. "Promoting Recovery or Hedging a Bet Against Extinction: Austin, Texas' Risky Approach to Ensuring Endangered Species' Survival in the Texas Hill Country." Environmental Law. 24;2.

Tear, T. et al. 1995. Recovery Plans and the Endangered Species Act: Are Criticisms Supported by Data? Conservation Biology. 9;1.

USFWS. 1999. Draft Environmental Assessment for the Issuance of an Incidental Take Permit...for the Incidental Take of the Northern Spotted Owl...to Boise Cascade Corporation for Property Located in Clatsop County, Oregon. US Fish & Wildlife Service, Portland, OR.

USFWS et al. 1998. Draft Environmental Impact Statement/Environmental Impact Report for the Headwaters Forest Acquisition and the PalCo Sustained Yield Plan and Habitat Conservation Plan. Vol. II. Prepared by the US Fish & Wildlife Service, Arcata, CA, and the California Dept. of Forestry & Fire Protection, Sacramento, CA.

WAFC *et al.* 1997. Giving It All Away: The "No Surprises" Policy and the Future of Endangered Species, Northwest Forests, and Public Policy. Western Ancient Forest Campaign, Portland, OR.

Walley, KK. 1996. "Surprises Inherent in the No Surprises Policy." Endangered Species Update. 13;10&11. School of Natural Resources & Environment, University of Michigan, Ann Arbor.

Welner, J. 1995. Natural Communities Conservation Planning: An Ecosystem Approach to Protecting Endangered Species. Stanford Law Review. 47; 319.

Welsh, H., A. Lind, L. Ollivier, et al. 1998. Comments on the PalCo HCP/SYP and EIS/EIR With Regard to the Maintenance of Riparian, Aquatic, and Late Seral Ecosystems and Their Associated Amphibian and Reptile Species. Herpetology Research Group, Pacific Southwest Research Station, USDA Forest Service, Arcata, CA.

Wilcove, D., et al. 1996. Rebuilding the Ark: Towards a More Effective Endangered Species Act for Private Land. Environmental Defense Fund, Washington, DC.

***ESA and HCP Policies:***

Arum, J. 1998. Letter to William Daley, *et al*, Regarding the Tribes' Notice of Intent to Sue. Ziontz, Chestnut, Varnell, Berley, & Slonim, Seattle, WA.

Council on Environmental Quality. Guidelines for NEPA scoping. Available online at: <http://ceq.eh.doe/gov/nepa/regs/scope/scoping.html>

Endangered Species Act. Codified at 16 U.S.C. ss. 1531-1544. Available through USFWS website.

Gaffney, B., et al. 1997. Letter to Bruce Babbitt, et. al., Regarding Agency Discretion in Processing Pacific Lumber Company's Habitat Conservation Plan. Law Office of Brian Gaffney, Oakland, CA.

Hall, D. 1999. "Incentives and Land Acquisition: Key Tools for Restoring Fish and Wildlife Habitat." Endangered Species UPDATE. 16(3).

Heiken, D. 1997. Letter to Sec. Bruce Babbitt, et al, From the ONRC, et al, on Procedural Concerns With Weyerhaeuser Willamette HCP. Oregon Natural Resources Council, Eugene, OR.

Heiken, D., et al. 1997. Letter to Curt Smitch, USFWS, et al, from the ONRC, et al, Regarding the Weyerhaeuser Willamette HCP. Oregon Natural Resources Council, Eugene, OR.

Keeton, B., et al. 1996. Comments of the Wilderness Society on Draft Environmental Alternatives Analysis for a 4(d) Rule for the Conservation of Northern Spotted Owl on Non Federal Lands. The Wilderness Society, Seattle, WA.

Mueller, T., et al. 1996. Letter to Secretary Bruce Babbitt et al Regarding Pacific Lumber Application for Incidental Take Permit. Law Office of Brian Gaffney, Oakland, CA.

Mueller, T., et al. 1997. Letter to Bruce Halstead, USFWS, on EPIC and Sierra Club NEPA Scoping Comments for Louisiana Pacific HCP. Env. Law Found. and Law Office of Brian Gaffney.

NMFS. 1997. Memorandum of Agreement Between the State of Oregon and the National Marine Fisheries Service. National Marine Fisheries Service.

No Surprises Rule. Amendments to 50 CFR 17 and 50 CFR 222. 63 Federal Register 35, February 23, 1998.

Notice of Availability of a Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process. [Federal Register, 64;45, March 9, 1999]

Safe Harbors Agreements and Candidate Conservation Agreements....Final Rule and Notices. [June 17, 1999 Federal Register, 64;116]

Safe Harbor Policy and Candidate Conservation Agreements Draft Policy, Notices; and Safe Harbor and Candidate Conservation Agreements, Proposed Rule. 62 Fed. Reg. 113 (June 12, 1997).

*Sierra Club et al v. Bruce Babbitt et al.* [Civil Action No. 97-0691-CB-C, Order August 4, 1998, S. Dist., AL, S. Div.]

USEPA. 1998. Biological Assessment of the Revised Oregon Water Quality Standards for Dissolved Oxygen, Temperature, and pH. Prepared for the US Fish & Wildlife Service and National Marine Fisheries Service by the US Environmental Protection Agency, Seattle, WA.

USFWS et al. 1994. Preliminary Draft Handbook for Habitat Conservation Planning and Incidental Take Permit Processing. US Fish & Wildlife Service and National Marine Fisheries Service. Washington, DC.

USFWS et al. 1996. Endangered Species Habitat Conservation Planning Handbook. US Fish & Wildlife Service and the National Marine Fisheries Service. Washington, DC.

Letter - G4. Signatory -Defenders of Wildlife.

November 14, 2002



Amedee Brickey
US Fish & Wildlife Service
1655 Heindon Rd.
Arcata, CA 95512

James F. Bond
National Marine Fisheries Service
1655 Heindon Rd.
Arcata, CA 95521

**RE: Comments on Simpson Resource Company Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances and Draft Environmental Impact Statement**

Defenders of Wildlife submits these comments regarding the *Draft Environmental Impact Statement for Authorization for Incidental Take and Implementation of a Multiple Species Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances, Simpson Resource Company ("Simpson"), Del Norte and Humbolt Counties, California* (DEIS) and the *Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances (AHCP/CCAA).*

Defenders of Wildlife ("Defenders") is a 430,000 member private, non-profit, national wildlife conservation organization. Defenders works to protect all native wild animals and plants in their natural communities by advocating proactive approaches to wildlife conservation and encouraging protection of entire ecosystems and interconnected habitats. This letter is submitted on behalf of our 100,000 members in California.

Throughout this letter, we use the terminology adopted by the DEIS and AHCP/CCAA.

As set forth below, our review of the DEIS, AHCP and associated documents reveal the following:

I. The DEIS and AHCP/CCAA are founded on an inappropriate baseline condition and thus lack consideration of a true "No Action Alternative.

II. The AHCP/CCAA lacks a formal biological assessment of the viability of Covered Species.

California Office
926 J Street
Suite 522
Sacramento, California 95814
Telephone: 916-313-5800
Fax: 916-313-5812
www.defenders.org
www.kidsplanet.org

## Response to Comment G4-1

See Master Response 1 regarding the baseline, and Master Response 2 regarding the No Action Alternative.

Emphasis is placed on appropriate comparisons, e.g., between the No Action Alternative and existing environmental conditions in terms of habitat, species and riparian and aquatic ecosystem health and between the action alternatives, including the Proposed Action, and the No Action Alternative. Baseline conditions are set forth on an HPA-by-HPA basis in AHCP/CCAA Section 4.4 and EIS Chapter 3. There, the Plan and EIS describe and assess geologic and geomorphic factors and the current status of the covered species and their habitats. They discuss characteristic habitat types in each of the areas as well as existing factors that appear to be limiting for the covered species, their habitats, or the proper functioning of healthy aquatic/riparian ecosystems. Comparison of impacts associated with each of the alternatives is set forth in EIS Table 2.7-1. Timber harvesting and other forest management activities are evaluated in the EIS and AHCP/CCAA only to the extent that differences in their application and different environmental conditions would exist as a result of implementation of the AHCP/CCAA or one of the other alternatives.

## Response to Comment G4-2

In "NEPA's 40 Most Frequently Asked Questions" (http://ceq.eh.doe.gov/nepa/regs/40), the CEQ notes that the "No Action" alternative may be thought of in terms of continuing with actions where ongoing programs and activities (such as timber harvesting pursuant to the CFPRs) would continue, even as new plans are developed. In these cases, like for this Plan and these

III. The conservation objections and measures of the AHCP/CCAA's Conservation Plan do not analyze biological relevance to the Covered Species.

IV. The AHCP/CCAA generally lacks quantitative analyses throughout and instead relies on unsubstantiated claims.

V. The overall impacts of the AHCP/CCAA on the Covered Species are not adequately assessed.

VI. The DEIS and AHCP/CCAA conspicuously lack a cumulative effects analysis or any discussion of overall watershed/downstream effects of the proposed Plan.

VII. Overall, the management prescriptions of the AHCP/CCAA are based primarily on current California Forest Practices regulations and are, as such, grossly insufficient in providing proactive conservation of the Covered Species.

I. INAPPROPRIATE BASELINE CONDITION AND LACK OF TRUE "NO ACTION" ALTERNATIVE

G4-1 As written, the baseline condition used for analysis in the DEIS and AHCP/CCAA is an extension of current logging practices into the future rather than the existing on-the-ground conditions in the environment. As such, the DEIS and AHCP/CCAA fail to analyze the significance of adverse impacts of the actual project - timber harvest and related activities under the AHCP/CCAA.

G4-2 Section 4 of the DEIS, "Environmental Consequences," is founded on this false baseline. When comparing all the alternatives, the underlying assumption is that all, including the "No Action" alternative, include perpetuation of current logging practices. For example, it is stated that "Under the Proposed Action, establishing EEZs would result in a reduction in Primary Assessment Area Locations potentially exposed to soil compaction from use of heavy equipment." Under a true No Action alternative, there would be no soil compaction from heavy equipment because logging would not occur. Another example: Section 4.3.3.2 "The Proposed Action's canopy closure requirements and tree retention standards are more protective than those that would be implemented under the No Action Alternative....the inner zone width along Class I watercourses is slightly less under the Proposed Action (50-70 feet) than under the No Action Alternative (75 feet)." In this case, not only is the No Action Alternative *clearly* not the true environmental baseline of no logging activities, but the Proposed Alternative actually decreases riparian protection from current status-quo levels. Therefore, the conclusion that "Overall, the conservation measures under the Proposed Action are anticipated to minimize the potential impacts that could otherwise result from altered hydrology in the Primary Assessment Area. They would reduce the impacts of forest management on surface runoff and peak flows, reduce soil compaction and disturbance, and maintain or enhance in-channel LWD" is made without any regard to or quantification of the actual impacts of timber harvesting and associated activities.

G4-3 The AHCP/CCAA glossary (Section 10) defines "Covered Activities" as "Certain activities

Permits, the No Action Alternative equates to “no change” from current management direction or level of management intensity. See Master Response 1 regarding baseline and Master Response 2 regarding the No Action Alternative.

## Response to Comment G4-3

See Master Response 1, which identifies the most meaningful points of comparison for the assessment of potential impacts as “with the project” (Permit issuance and implementation of the Plan) and “without the project” (no Permits, no Plan). Under the “project”, issuance of the Permits and Plan implementation, the impacts of take identified in the Plan and the conservation measures identified in the Operating Conservation Program (AHCP/CCAA Section 6.2) would be carried out. For this reason, the Plan and EIS compare baseline conditions with the conditions that are expected to occur under the No Action Alternative, and the conditions that are expected to result from this combination of circumstances under the various action alternatives, including the Proposed Action, relative to the conditions that are expected to occur under the No Action Alternative. See AHCP/CCAA Sections 5 and 7 and EIS Chapter 4.

## Response to Comment G4-4

AHCP/CCAA Section 5 discusses the potential impacts of incidental take on the covered species and their habitats that might occur as a result of timber harvesting and other forest management activities within forested landscapes if take were authorized but without the benefit of the Operating Conservation Program's prescriptions. The discussion in AHCP/CCAA Section 5 supplements the discussion in AHCP/CCAA Section 2 regarding the covered activities, AHCP/CCAA Section 3 regarding the covered species and their habitats, and AHCP/CCAA Section 4, which includes an HPA-by-HPA discussion of the current status of the covered species and their habitats. AHCP/CCAA Section 7, not Section 5, discusses the expected results for the covered species and their habitats of implementation of the Operating Conservation Program (AHCP/CCAA Section 6.2) in the Plan Area.

A summary of existing stream conditions and an assessment of their ability to support the covered species within the Primary Assessment Area is also presented in EIS Section 3.4.4 (Aquatic Habitat Conditions). The analysis of potential environmental consequences associated with implementation of the Proposed Action relative to the No Action Alternative and existing conditions is presented in EIS Chapter 4. As noted in EIS Section 4.4.3, the Services expect habitat conditions to improve under the Proposed Action and aquatic and riparian resources would realize incremental improvements compared to the No Action Alternative and current conditions. This would be largely attributable to implementation of the Road Management Plan, enhanced riparian zone protection, and other conservation measures, as a whole, which are described in EIS Chapter 2.2 as part of the Proposed

carried out by Simpson in the Plan Area that may result in incidental take of Covered Species and all those activities necessary to carry out the commitments reflected in the Plan's Operating Conservation Program and IA." Section 5.1 of the AHCP/CCAA explicitly lists some of these Covered Activities as the logging practices: "Of the Covered Activities, Simpson's timber harvesting operations and the road construction maintenance or use, as well as construction, maintenance and use of landings, culverts and crossings associated with such harvesting have the greatest potential to cause environmental effects – both individual and cumulative – which, in turn, could result in take of Covered Species." The DEIS only assesses the environmental impacts of the Conservation Plan, while ignoring the other Covered Activities. Thus, the DEIS falsely concludes that the "overall effect of implementation [of the proposed AHCP/CCAA] would result in net environmental benefits" without ever mentioning the impacts of the above Covered Activities that would be most detrimental to the Covered Species.

G4-3

Over and over, the AHCP/CCAA admits that current practices endanger Covered Species: Section 5.5.2, regarding potential effects of increased temperature on Covered Species: "The potential impacts of such taking include potential reductions in the local or regional populations of the Covered Species and could affect a possible need to list currently unlisted Covered Species under the ESA in the future."; Section 5.5.3, on Altered Nutrient Input: "Take of Covered Species could occur as the result of temperature increases causing the impairment of essential function...[resulting in] potential reductions in the regional populations of the Covered Species." However, these detrimental practices are used inappropriately as a baseline for the AHCP/CCAA and DEIS assessments of environmental impact. While Simpson's timber management practices are covered in the Simpson Northern Spotted Owl HCP, they are not approved for the take of listed aquatic species and therefore must be addressed in the AHCP/CCAA . Especially since the current practices are admittedly detrimental to the Covered Species' populations, the misused baseline is all the more deplorable.

G4-4

By failing to invoke the appropriate baseline condition and wrongly defining the "No Action alternative, the DEIS is in violation of the National Environmental Policy Act (NEPA). NEPA regulations require an EIS to "provide a full and fair discussion of significant environmental impacts." (40 C.F.R. 1502.1). In this case, the DEIS does not provide *any* discussion of the environmental impacts of the Covered Activities most likely to be detrimental to the Covered Species.

G4-5

II. FORMAL VIABILITY ASSESSMENT LACKING

The AHCP/CCAA does not include an adequate assessment of current biological viability of the Covered Species in the Proposed Area. Section 4 details the Current Status of habitat and Covered Species with vague statements such as "Big Lagoon is believed to support a 'fair' population of coastal cutthroat trout" at best. When Simpson has conducted surveys, primarily for the amphibian species, they are based on a one time presence/ absence count which alone is not useful in indicating population trends. Without a formal assessment of the current biological viability of the Covered Species, it is impossible to assess the ability of the Conservation

G4-6

Action. Overall, the minimization and mitigation measures are expected to reduce harvest and road-related sediment production and delivery to Primary Assessment Area streams and to maintain or enhance existing riparian and aquatic conditions. The anticipated improvement in riparian conditions and the reduction in sediment production and delivery to streams would occur in a shorter time than those expected under the No Action Alternative and would likely result in improved physical habitat for the seven covered fish species/ESUs and two covered amphibian species.

As noted in the response to Comment G4-1 above, under No Action Alternative for the Plan and the EIS, the Services would not issue the requested Permits and Green Diamond would not implement the Plan. As described in EIS Section 2.1, the No Action Alternative has been developed to evaluate current conditions. Under the No Action Alternative, existing activities would continue, including Green Diamond's current operations as governed by its NSO HCP and all applicable laws. See AHCP/CCAA Section 1.4. The most meaningful points of comparison, therefore, are with the project (issuance of the Permits and implementation of the Plan - the "Proposed Action") and without the project (no Permits, no Plan - the "No Action Alternative"). For the No Action Alternative, the appropriate comparison is between existing environmental conditions in terms of habitat, species and riparian and aquatic ecosystem health and the conditions that are expected to occur over time under the No Action Alternative. See Master Response 2 regarding the No Action Alternative and Master Response 1 regarding the baseline.

Please see responses to Comment G4-1 and G4-2 above.

## Response to Comment G4-5

For the reasons discussed in response to Comment G4-3 and in Master Responses 1 and 2, and based on analysis provided in the EIS, the Services believe that the EIS does provide a full and fair discussion of significant environmental impacts associated with the covered activities as reflected in EIS Chapter 4 (Environmental Consequences).

Regarding the comparison between current conditions and the No Action Alternative, and among the action alternatives and the No Action Alternative, see EIS Chapter 4 (Environmental Consequences).

## Response to Comment G4-6

By "biological viability" this comment seems to imply that the current species' status within the Plan Area and the current condition of the species' habitats, are not adequately described in the Plan, such that the Services or commenters can determine the impacts of taking and, thus, whether such impacts are adequately mitigated. The Services disagree and believe that the baseline conditions of the covered species and habitats are adequately described in the Plan. See, for example, AHCP/CCAA Sections 3 and 4. Master Response 8 sets forth the approval criteria for this AHCP/CCAA and Master Response 1 discusses the baseline conditions and their role in ESA analyses.

## Response to Comment G4-7

See Master Response 12. Further, as stated in AHCP/CCAA Section 6.1.2, the covered activities all share some common habitat needs. Those certain biological needs that are common to the covered species, which were considered in developing the goals and objectives for the conservation program, include cool water temperatures and complex stream habitat morphology and substrates. The AHCP/CCAA Section 6.1.2 briefly describes components of each of the covered species' life history, which also were considered when developing the biological goals and objectives for the Operating Conservation Program. A discussion of the key life history traits and biological requirements for each of the covered species are discussed in detail in AHCP/CCAA Section 3.2 and each species' key habitat requirements are discussed in AHCP/CCAA Section 3.3. A more detailed discussion of these life histories and habitat characteristics are provided in Appendix A of the AHCP/CCAA.

From the discussion of the purpose of the Plan (AHCP/CCAA Section 1.2) which states that the *"...purposes of the AHCP/CCAA are for...providing for the conservation of the individuals..."* and the five specific biological goals bulleted and shown in AHCP/CCAA Section 6.1.2.1, it is clear that the needs of the covered species were the basis of the Operating Conservation Program measures, which were developed to minimize the impact of incidental take on the covered species. Furthermore, of the five biological objectives, three were directly based on habitat needs for the covered species (e.g. summer water temperature, LWD recruitment, and sediment delivery) and one was based on population (amphibian populations). The Operating Conservation Program measures, based on the goals and objectives, are expected

Measures to assess the current threats posed by the Covered Activities. Consequentially, it is also impossible to adequately judge the potential success of the ACHP/CCAA to minimize and mitigate the impacts of timber harvesting activities on the Covered Species. Therefore, without an adequate assessment, any conclusions drawn by federal decision makers that are based on this AHCP/CCAA and DEIS will be arbitrary and capricious. G4-6

III. BIOLOGICAL RELEVANCE OF CONSERVATION PLAN NOT ADDRESSED

The biological goals and objectives presented in Section 6.1 of the AHCP/CCAA are not linked to the biology of the Covered Species. Section 6.1.1 states: "to minimize and mitigate the impacts of incidental take within the Plan Area as described in this AHCP and to ensure that such take does not jeopardize the Covered Species, Simpson intends to undertake management measures that will, during the term of the Permit protect, and where needed allow development of the functional habitat conditions that are required for long-term survival to support well-distributed, viable populations of the Covered Species." However, in the two pages that follow, all of these goals and objectives are set out without justification of how they address the needs of the Covered Species. For example, the summer water temperature objective is based on the current levels of temperature found in the Plan Area. As discussed in I. above, the use of this degraded system as a baseline is inappropriate and biologically invalid. The sediment delivery objectives are not tied to the habitat needs of the Covered Species. The sediment delivery studies in Simpson Hydrographic Planning Areas (HPAs) must tie sediment delivery volumes to habitat degradation, stasis or improvement. Further, the assumption that reducing road-related sediment by 70% from current levels is adequate to avoid road-related jeopardy to the covered species is impossible to assess give the lack of ecological basis for such a standard. The appropriate objective for slope stability measures is to prevent alteration of the natural landslide regime. Given this ecological basis, the fact that the AHCP/CCAA still allows new roadbuilding in riparian areas and on landslide-prone locations is potentially significantly detrimental the biological status of the Covered Species. The AHCP/CCAA fails to address this. Appendix E does, however, provide information that current levels of management-related erosion increase the watershed scale level of erosion between 30 and 300% beyond natural conditions. Although not directly linked to biological significance, one would assume that such a large level of increased erosion will have a detrimental effect on the Covered Species. As such, this effect must be addressed in the AHCP/CCAA. G4-7 G4-8 G4-9 G4-10 G4-11

As another case in point, the riparian management measures specifically fail to address the needs of the Covered Species. For example, the importance of creating unharvested streamside areas and retaining the largest trees are not addressed. It is particularly important for the amphibian species to create and maintain interior or "core" areas of riparian forest where conditions are suitable for cold-water adapted amphibians. Wide no-cut buffers of 30 meters or more are necessary to provide the microclimate required by the adult life stages of the tailed frog and southern torrent salamander. (Welsh et al. 2000). As currently proposed, timber harvest is allowed in all streamside riparian management zones (RMZs), explicitly ignoring the biological needs of the Covered Species. G4-12

to minimize and mitigate any impacts of incidental take on the ITP species and, with respect to the covered ESP species, to comply with the CCAA standards. See Master Response 8.

## Response to Comment G4-8

See Master Response 1

## Response to Comment G4-9

See Master Responses 1 regarding baseline conditions, and Master Response 17 regarding road density.

## Response to Comment G4-10

To clarify, implementation of the Operating Conservation Program is not intended to result in a 70 percent reduction in sediment delivery from roads or management-related landslides, but a 70% reduction in management-related sediment delivery from landslides in the SSS zones. The Services recognize AHCP/CCAA Section 6.1.2.2.4, Number 2, which states as the Plan's biological objective: "Achieve a 70 percent reduction in sediment delivery from management-related landslides in harvested steep streamside slopes compared to delivery volumes from appropriate reference areas within clearcut stands." However, the Services also recognize that, for the reasons discussed in Master Response 12, biological goals and objectives are not themselves enforceable in this Plan. This said, the Plan does not propose to reduce road related sediment delivery by 70 percent. By the end of the term of the Permits, road-related sediment is expected to be reduced by 90% (AHCP/CCAA Appendix F). The various elements of the road program, including risk assessment, watershed and sub-watershed prioritization, road assessment, and the implementation standards are described in AHCP/CCAA Sections 6.2.3 and 6.3.3. The riparian conservation measures in AHCP/CCAA Section 6.2.1 do not allow road construction to occur in RMZs with the exception of very specific reasons that must be explained and justified (see AHCP/CCAA Section 6.2.3.11.5). Additionally, there are specific measures in the Plan to avoid new road construction on all MWPZs (i.e., steep streamside slopes, headwall swales and deep seated landslides) and shallow rapid landslides.

## Response to Comment G4-11

See response to Comment G4-7.

Appendix E of the AHCP/CCAA states that recent TMDL studies found a 30% - 300% increase in erosion due to timber management influences during the period since the CFPRs were enacted. The Plan cites that these results should be viewed with caution owing to the different scales and methods employed on each of these studies. Further caution is advised in comparing these results to actual current forest management impacts due to annual incremental increases in protection provided by the evolving rules. For example, the Threatened and Impaired rule package (14 CCR 916.9) was passed in 2000, which means the past 4 years of standard practices are more conservative than the previous 25 years of standard practices. Also, although the studies were reported to cover the period of only the last 30 years, it is likely that residual legacy impacts were unknowingly or inadvertently included in the data, such as, for example, sedimentation from a poorly placed road (either by surface erosion or mass wasting) that would not be permitted (or even proposed) under current standards of practice. This example reinforces the caution of extrapolating results due to different methodologies of data collection and study design. Lastly, the Plan proposes to minimize and mitigate the impact of take with a suite of conservation measures (AHCP/CCAA Section 6.2), including, among others, aggressive road management measures (AHCP/CCAA Section 6.2.3) and riparian management measures (AHCP/CCAA Section 6.2.1). The Services believe that implementation of the Operating Conservation Program as a whole will meet the ESA Section 10(a) Permit issuance criteria, which are discussed in AHCP/CCAA Section 1.4.1 and Master Response 8.

## Response to Comment G4-12

See response to Comment G3-44 and Master Response 18. Further, site specific survey data collected within the Plan Area and those of Diller and Wallace (1996 and 1999), all presented in AHCP/CCAA Appendix C11, indicate that the covered amphibian species do not require wide no-cut buffers. Therefore, the Services believe that the buffers for RMZs as provided for in AHCP/CCAA Section 6.2.1 are expected to adequately protect the covered amphibian species.

## Response to Comment G4-13

All Plan measures were reviewed to ensure that such subjectivity would not exist as to make implementation difficult or the Plan itself unenforceable. The Plan has extensive analytical support and an objective and sound rationale for the Plan's conclusions (see generally AHCP/CCAA Sections 2 through 5 and the Appendices) and the resulting measures contained in the Operating Conservation Program (AHCP/CCAA Section 6.2). The AHCP/CCAA Section 7 analyzes the effectiveness of the Plan's conservation strategy. The AHCP/CCAA Section 7's analysis extends the AHCP/CCAA Section 4's assessment of the current conditions for the covered species in the area where the Plan will be implemented and the AHCP/CCAA Section 5's assessment of the potential impacts of covered activities that may result in take and the types of effects that such take may have on covered species. In AHCP/CCAA Section 7, all possible impacts of take that may occur are examined, together with their relative significance to each of the covered species by category and in relation to all potential impacts and measures.

## Response to Comment G4-14

The commenter referred to a workshop that was held on March 18 and 19, 1999. The statistician the commenter refers to presented mean bankfull widths for Cañon Creek, indicating that the mean bankfull width increased from 47.4 feet in 1995 to 62.1 feet in 1996. The statistician indicated that this statistically significant increase in mean bankfull width was a result of a large flood event with approximately a 10 year recurrence interval. The statistician did not indicate that, during the course of the study, the channel

G4-13 Overall, the AHCP/CCAA invokes extremely subjective, discretionary provisions with no analysis of how the measures would impact the Covered Species.

VI. LACK OF QUANTITATIVE ANALYSIS THROUGHOUT

G4-14 The AHCP/CAA lacks any quantitative analysis and is instead replete with broad, unsubstantiated statements. The following excerpts from Section 7 are illustrative: "The increased pool habitat will help avoid displacement or minimize the effects of displacement of juvenile salmonids caused by peak flows," and "Over time, this conservation measure will increase the amount of LWD in streams, which will ultimately increase overwintering habitat for juvenile salmonids. Large woody debris recruitment will mitigate the impacts of displacing Covered Species that results from altered hydrology by providing increased habitat alternatives for juveniles that are displaced during a storm event." These statements beg the questions: How much pool habitat will be increased? What will the peak flows levels be? Will the increase in pool habitat be enough to mitigate the altered peak flows so that the necessary natural/ biological conditions are met? How much LWD will be increased in the streams? How does this compare to natural quantities of LWD? What type of altered hydrology, in what quantities will occur? Will the amount of increased habitat alternatives be enough to maintain populations of juveniles?

G4-15 Other general questions unanswered by the AHCP/CCAA are: How do the management goals compare quantitatively with the current regulatory statutes that Simpson is already beholdant to by state and federal law? What are the effects of current management practices on the Covered

G4-16 Species in the Plan Area? How will the each specific conservation management practice address the impacts of Covered Activities on the Covered Species? These crucial questions are not answered anywhere in the AHCP/CCAA or the DEIS. The strongest approach at causal language relating practices under the Proposed Plan to effects on Covered Species are illustrated in this example from Section 5.3.4 "Negative effects of excess course sediment on pool habitat are believed to be potentially significant for the salmonid Covered Species." This lack of quantitative analysis is simply unacceptable and all broad conclusion about the impact of the Covered Activities on the Covered Species are grossly unsubstantiated.

G4-17 DEIS Section 4, Environmental Consequences: "The conservation measures under the Proposed Action are anticipated to minimize the potential impacts that could otherwise result from altered hydrology in the Promary Assessment Area. They would reduce the impacts of forest managment on surface runoff and peak flows, reduce soil compaction and disturbance, and maintain or enhance in-channel LWD. Any impacts to hydrology and water quality that would occur would be mitigated by improved riparian conditions resulting from riparian management and decreased sediment production and delivery, as described below." Unfortunately, the following discussion does not contain the necessary quantification of impacts on the Covered Species. Therefore, the general conclusions of no negative effects that the DEIS claims are unsubstantiated.

increased to 150 feet as the commenter indicated. The channel shift that occurred in the Mad River in 1998 has extended the low flow confluence of Cañon Creek further downstream which may limit early access of anadromous salmonids. However, data submitted by Green Diamond in support of its Plan indicates that since the 1996 flood event, anadromous salmonid access into Cañon Creek has occurred, including coho salmon, even in low flow years. See AHCP/CCAA Section 4.4.8.7.1.

## Response to Comment G4-15

The ESA does not require a quantification of conservation benefits for ITPs, but instead that a Permit applicant's conservation program minimize and mitigate the impacts of authorized incidental take of covered species that may result from covered activities "to the maximum extent practicable" (50 CFR 17.32(b)(2)(i)(B)). See Master Response 9. Both qualitative and quantitative analyses are acceptable and desirable in the context of an HCP/CCAA (*National Wildlife Federation v. Babbitt*, 128 F.Supp.2d 1274, 1291 [2000]). The management measures Green Diamond has elected to include in its Operating Conservation Program are set forth in AHCP/CCAA Section 6.2 and the biological goals and objectives upon which they have been developed are set forth in AHCP/CCAA Section 6.1. Implementation of the Operating Conservation Program will minimize and mitigate the impacts of incidental take as described in the Plan and ensure that such take does not jeopardize the continued existence of the covered species and will protect and, where needed, allow development of the functional habitat conditions that are required for long-term survival to support well-distributed, viable populations of the covered species. Further, the Plan will meet the ESP/CCAA standards set forth in the AHCP/CCAA Section 1.4.1 and in Master Response 8 with regard to the unlisted covered species subject to USFWS jurisdiction. Accordingly, the Operating Conservation Program (AHCP/CCAA Section 6.2) complies with current regulatory requirements. Further, approval of the Plan and issuance of the Permits fits into a larger context that includes, among other things, the CFPRs and other State law, Green Diamond's NSO HCP and other conservation efforts. See AHCP/CCAA Section 1.4.

## Response to Comment G4-16

AHCP/CCAA Section 7 specifically describes how the conservation measures will address the impacts of taking on the covered species and describes the expected effectiveness of the measures to achieve their purposes. The measures included in the Operating Conservation Program are considered as a whole, rather than separating out the benefits of each measure. In addition, as stated in AHCP/CCAA Section 1.4.2, Green Diamond's current management practices fall under the guidance of CFPRs and Green Diamond's NSO HCP. See AHCP/CCAA Section 1.4.3. In addition, Green Diamond's management practices are subject to other resource conservation efforts including the Salmon Creek Management Plan and the Management Strategies for the Little River Watershed, and cooperative agreements such as those with the Yurok Tribe and the Coastal Conservancy, Redwood National Park and other agreements as outlined in AHCP/CCAA Section 1.4.4. The net effect of these management practices is that significant protection currently is being provided to the covered species, water quality and aquatic habitats. Quantification of benefits has been provided where possible. For example, the Plan predicts that measures to treat high- and moderate-risk sites in the road implementation plan will stabilize approximately 48 percent of the road-related sediment in the first 15 years of the Plan, as opposed to only 19 percent without the Plan. It is not known how much pool habitat will be increased as a direct result of the reduction of sediment inputs to the stream, and the ESA does not require the Services to quantify the benefits to the covered species covered by the Permits, as long as the criteria for Permit issuance have been met. (See also Master Response 8.) In other words, the Plan as a whole, including each of the individual measures, will supplement existing mechanisms to protect the covered species and their habitats in the Plan Area over the term of the Plan and Permits.

## Response to Comment G4-17

The text of the EIS quoted in the comment is from the description of environmental consequences on hydrology and water quality (EIS Section 4.3). Accordingly, it would not be appropriate to include a discussion of the impacts on the covered species in this Section. In contrast, the discussion of potential impacts to aquatic resources (EIS